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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/690,607

10/23/2003

Tsuyoshi Maeda

117304

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06/14/2005

OLIFF & BERRIDGE, PLC

P.O. BOX 19928

ALEXANDRIA, VA 22320

EXAMINER

SCHECHTER, ANDREW M

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/690,607

Applicant(s)

MAEDA, TSUYOSHI

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 3-6, 9-14, 16, 17, 19, 20, 24, 25, 27, 28, 32 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7, 15, 18, 21-23, 29-31 and 34-37 is/are rejected.
- 7) ☒ Claim(s) 8 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Transflective liquid crystal display having biaxial retarder".

Claim Objections

2. Claim 21 is objected to because of the following informalities: claim 21 recites the fourth and the sixth retardation films without appropriate antecedent. It is assumed that on the first and second retardation films were intended to be referred to. Appropriate correction is required.
3. Claims 35 and 36 are objected to because of the following informalities: "the electrode" does not have appropriate antecedent; it is assumed "an electrode" is intended. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

Art Unit: 2871

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 7, 15, 18, 21-23, 29, 30, and 34-37 are rejected under 35

U.S.C. 102(e) as being anticipated by *Jisaki et al.*, U.S. Patent No. 6,753,939.

Jisaki discloses [see Fig. 1, for instance] a liquid crystal display device comprising a liquid crystal layer [3] between a first substrate [1] and a second substrate [2], one dot [one pixel] including a reflective display region [5] and a transmissive display region [6], the liquid crystal layer include a nematic liquid crystal [see Fig. 2] having negative permittivity anisotropy oriented substantially perpendicularly to the substrates [col. 6, line 61 – col. 7, line 20], a first retardation film [8] and a first polarizer [10] disposed in this order on the outer side of the first substrate, a second retardation film [9], a second polarizer [11] and an illuminating device [12] being disposed in this order on the outer side of the second substrate, and at least one of the first retardation film and the second retardation film having optical biaxiality [col. 8, line 65]. Claim 1 is therefore anticipated.

Both retardation films may be biaxial [col. 8, line 65], so claim 2 is also anticipated. The retardation values (or equivalently phase differences) of the two retardation films are equal [col. 8, lines 50-54, for instance], so claim 15 is also anticipated. The retardation films are $\lambda/4$ plates in the visible wavelength range [for instance at 550 nm, where the phase difference would be 138 nm], so the retardation values are between 100 nm and 160 nm, so claim 18 is also anticipated.

The thickness of the liquid crystal layer in the reflective display region is smaller than the thickness in the transmissive region [see Fig. 1], so claim 7 is also anticipated. The retardation films are $\lambda/4$ plates in the visible wavelength range, so $R(450) / R(590)$ is smaller than 1, so claim 21 is also anticipated. The polarizers are orthogonal [col. 8, lines 30-31], so claim 22 is also anticipated. The phase difference values of the first and second retardation film are substantially equal [col. 8, lines 50-54], so claim 23 is also anticipated. There is a reflection layer [25], having an irregular configuration for performing scattered reflection [see Fig. 4], so claims 29 and 30 are anticipated. There is a protuberance [13] formed on an electrode formed on the inner surface of one of the substrates, adjacent the liquid crystal, so claim 35 is also anticipated. There can instead be an electrode having an opening [50, see Fig. 16] to drive the liquid crystal, on the inner surface of one of the substrates, adjacent the liquid crystal, so claim 34 is also anticipated. There are at least two liquid crystal directors in one dot [pixel] when the liquid crystal is driven by an electrode [see Fig. 2], so claim 36 is also anticipated. This is electronic equipment, so claim 37 is also anticipated.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 22, 29-31, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kubo et al.*, US 2001/0055082 in view of *Jisaki et al.*, U.S. Patent No. 6,753,939.

Kubo discloses [see Figs. 13 and 15, for instance] a liquid crystal display device comprising a liquid crystal layer [5] between substrates, with reflective and transmissive display regions, nematic liquid crystal having negative permittivity anisotropy oriented substantially perpendicularly [see Fig. 15 and discussion thereof], a first retardation film [7] and first polarizer [6] in this order, a second retardation film [10] and a second polarizer [9], and an illuminating device [see Fig. 13] in this order.

Kubo does not disclose that at least one of the retardation films has optical biaxiality; it appears that the retardation films are both uniaxial. *Jisaki* discloses, for an analogous device, using either uniaxial or biaxial retardation films [col. 8, lines 64-65]. This is evidence that optical uniaxiality and biaxiality are considered art-recognized equivalents in this specific context; it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use biaxial films in the device of *Kubo*, motivated by the art-recognized equivalence of the two.

Claims 1 and 2 are therefore unpatentable.

Kubo discloses crossed polarizers, so claim 22 is also unpatentable. *Kubo* discloses an irregular reflection layer, so claims 29 and 30 are also unpatentable. *Kubo* discloses that that the retardation films are orthogonal to each other in the X-axis direction, and form 45° angles with respect to the polarizers [see Fig. 15], so claim 31 is

Art Unit: 2871

also unpatentable. *Kubo* discloses electronic equipment, so claim 37 is also unpatentable.

Allowable Subject Matter

8. Claims 8 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose the device of claim 8, in particular that the sum $W1$ satisfies the recited inequality. Claim 8 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 26, in particular that the phase difference $((nx1+ny1)/2-nz1) \times d1$ satisfies the recited inequality. Claim 26 would therefore be allowable if rewritten appropriately.

Election/Restrictions

10. Applicant's election with traverse of Species I in the reply filed on 25 March 2005 is acknowledged. The traversal is on the ground(s) that the subject matter of all species are sufficiently related that a search and consideration of the entire application could be made without a serious burden. This is not found persuasive because in the opinion of

Art Unit: 2871

the examiner search and consideration of the entire application could not be made without a serious burden.

The requirement is still deemed proper and is therefore made FINAL.

11. Claims 3-6, 9-14, 16, 17, 19, 20, 24, 25, 27, 28, 32, and 33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 25 March 2005.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP A 5-113561, made of record by the applicant, discloses an LCD with biaxial retarders orthogonal to each other in the X-direction and at 45° to the polarizers. It does not appear to disclose transmissive and reflective regions, however.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2871

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Andrew Schechter
Primary Examiner
Technology Center 2800
7 June 2005